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ABSTRACT
Keywords – assessment, group work, poster session, written exam, learning loops

Rationale
The challenge presented here is how to utilise evaluation to promote active learning. The method used is constructive alignment (Biggs & Tang, 2007) of learning objectives, learning and evaluation along with further considerations including which competences are promoted, the time consumption for the evaluation. The case presented is from a Master course, which is organised around two projects: a feasibility study and a national energy system analysis. In both cases the students work in groups with a somewhat loosely defined project. In general the course is very well suited for discussions and organising the course with group work allows for plenty of that. Furthermore, as group work is how many companies organise work today – the ability to cooperate well in groups is assessed to be an important competence for engineering students to achieve. The course is taught using the principle of inductive learning (Prince & Felder, 2006) with the students being presented with the case from the beginning and subsequently achieving the tools to perform the projects. This is both frustrating and motivating for the students as they know why they need to have the tools, but they feel they get them too late.

The students have formerly been assessed through two group reports (each 25% of final grade) and an individual oral examination (50% of final grade). The students work a lot and learn a lot through working with the reports, but it is also very time consuming to write them as well as to grade them. For this purpose it was decided to change one report into a poster including a 15 minute group oral presentation. The oral examination allows for individual assessment of the students, for assessment of conceptual understanding and for learning during the examination. This type of evaluation is however very time consuming and a written examination will facilitate a better evaluation of whether the core elements of the course (including the tools used for the two projects) are achieved at an individual level, so it was decided to have a 4 hour written examination instead. Evaluation of conceptual understanding was undertaken through more open ended questions.

Results
Using a poster instead of a report for one of the projects was found to be very successful. The students used most of their time on discussing and using the tool, and less on reporting, which was the purpose. When asked, they claimed to have learned as much as if they had needed to hand in a report and where pleased to have the chance to try to report in the format of a poster. It was however difficult to evaluate the quality of the work within the given format and time frame.

The written exams with use of computers made it possible to have individual evaluations of the use of the tools, which were taught in the course. Furthermore, from the student questions received in the time up to the exam it was obvious that the students were practising the use of the tools, thereby ensuring an additional learning loop in this respect (Argyris & Schön, 1978). Overall the results of using the new types of evaluation were positive, with a few outstanding issues to be resolved, including: 1) high evaluation pressure for a 5 ECTS course 2) clearer definition of goals and more time for evaluating posters 3) leaner 2 hour written exam.

Session type: exploration symposium (1st priority) or interactive poster session (2nd priority)

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